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10/518,182	06/20/2005	Paul R Routley	30740/285902	3530

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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/518,182	ROUTLEY ET AL.	
	Examiner	Art Unit	
	JASON M. MANDEVILLE	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,7,10,13,14,17,23,27,28,30 and 31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,7,10,13,14,17,23,27,28,30 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 14 September 2009 has been entered.

Specification

2. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A

COMPACT DISC.

(f) BACKGROUND OF THE INVENTION.

(1) Field of the Invention.

(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

(g) BRIEF SUMMARY OF THE INVENTION.

(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(i) DETAILED DESCRIPTION OF THE INVENTION.

(j) CLAIM OR CLAIMS (commencing on a separate sheet).

(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Objections

3. **Claim 13** is objected to because of the following informalities: the claim depends from a cancelled claim. Appropriate correction is required. (For the purposes of examination, the examiner assumes that **Claim 13** depends from **Claim 1**).

4. **Claim 30** is objected to because of the following informalities: the claim repeats the limitations of **Claim 28**. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. **Claims 1, 4, 7, 10, 13, and 14** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. **Claim 1** recites "a power controller coupled to said voltage sensor for controlling an adjustable voltage power supply to said plurality of adjustable constant current generators...." This limitation is not supported in the specification. In fact, the specification clearly shows that the "power controller" controls an adjustable power supply voltage (Vss), not an adjustable voltage power supply to a plurality of constant current generators. Therefore, **Claims 1, 4, 7, 10, 13, and 14** are rejected as failing to meet the written description requirement.

7. **Claims 17, 23, 27, 28, 30, and 31** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. **Claim 17** recites "an adjustable voltage power supply coupled to said plurality of adjustable constant current generators…" and "reducing said power supply voltage responsive to said

monitoring…." This limitation implies that the "adjustable voltage power supply" controls a voltage of the "adjustable constant current generators" (i.e., in a similar manner as recited in **Claim 1**), and this limitation is not supported in the specification. In fact, the specification clearly shows that the "power controller" controls an adjustable power supply voltage (Vss), not an adjustable voltage power supply to a plurality of constant current generators. Therefore, **Claims 17, 23, 27, 28, 30, and 31** are rejected as failing to meet the written description requirement.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. **Claims 1, 4, 7, 10, 13, 14, 17, 23, 27, 28, 30, and 31** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. **Claim 1** recites a "plurality of adjustable constant current generators... coupled to establish said voltage on said gate connection of said pixel driver circuit…." Similarly, **Claim 17** recites a "plurality of adjustable constant current generators... driving… with an adjustable constant current determining said voltage on said gate connection…." It is wholly unclear from the claims, the specification and the associated drawings how the adjustable constant current generators are being implemented in the claimed pixel driver. The applicant has relied upon Fig. 7b and Fig. 8 to characterize the claimed invention. As such, it appears that the applicant is attempting to claim an unreasonable

number of implied features that are not clearly shown in the drawings and specification and are not clearly recited in the claims. In fact, based on the descriptions provided throughout the specification relating to Fig. 7b and Fig. 8 (see Page 25, Ln. 26-30 as one example), the applicant appears to be describing, as an adjustable constant current generator, an adjustable voltage generator coupled to establish the voltage on the gate connection. Furthermore, the applicant has claimed a "voltage sensor" to sense the voltage output by the constant current generators. Notwithstanding the principles of Ohm's Law, it is wholly unclear what voltage is being sensed by the voltage sensor. The drawings do not provide any clear understanding of this feature either. Simply stating, in the case of **Claims 1 and 17** that the "voltage on a said gate connection" is being sensed is not sufficient in this instance, because there is no gate voltage explicitly being applied to the gate of the driving transistor. The voltage being applied to the gate of the driving transistor appears to be some derivative of the current being supplied by the adjustable constant current generators. However, this feature is ambiguous. The applicant has not claimed any feature that would allow one of ordinary skill in the art to clearly ascertain the invention being claimed by the applicant without an unreasonable level of assumption and/or implication. Therefore, **Claims 1, 4, 7, 10, 13, 14, 17, 23, 27, 28, 30, and 31** are rejected as being vague and indefinite.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. **Claims 1, 4, 7, 10, 13, 14, 17, 23, 27, 28, 30, and 31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al. (hereinafter "Kimura" US 6,518,962) in view of Knapp et al. (hereinafter "Knapp" US 2002 / 0126073).

12. As pertaining to **Claim 1**, Kimura discloses a display driver (see Fig. 1, Fig. 3, and Fig. 5) for an active matrix electroluminescent display (see Abstract, Col. 1, Ln. 10-23 and Col. 23, Ln. 18-46), the display (see Fig. 1) comprising a plurality of electroluminescent pixels (10) each pixel (10) comprising a pixel driver circuit (see (10) along with (11, 12, 13, 14, 16, 21, 22, 23) of Fig. 3), each pixel driver circuit (see (10) along with (11, 12, 13, 14, 16, 21, 22, 23) of Fig. 3) including a drive field effect transistor (223) having a gate connection for driving the associated pixel in accordance with a voltage on the gate connection (Col. 19, Ln. 66-67 through Col. 21, Ln. 1-66), the display driver (see (10) along with (11, 12, 13, 14, 16, 21, 22, 23) of Fig. 3 and Fig. 5) comprising:

a plurality of adjustable constant current generators (i.e., see (ID, Iref) in (21) of Fig. 3 and Fig. 5 corresponding to a data current applied through a coupling of the signal line driving circuit (12); see Fig. 3 and Fig. 5) each for driving a row or column of the display (see Fig. 1, Fig. 3, and Fig. 5) and each configured to produce an adjustable constant current (i.e., a data current corresponding to (Iref, ID), for example) that is coupled to establish the voltage (i.e., the data voltage) on the gate connection of the pixel driver circuit (see (223) in Fig. 1; also see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-39);

a display element brightness controller (i.e., see (12, 16, 21, 22, 23) of Fig. 3 and Fig. 5) configured to control the plurality of adjustable constant current generators (i.e., see (ID, Iref) in (21) of Fig. 3 and Fig. 5 corresponding to a data current applied through a coupling of the signal line driving circuit (12); see Fig. 3 and Fig. 5) to drive the gate connections (see (223 in Fig. 1)) to control the electroluminescent output (224) from the pixels (10; see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-39; the electroluminescent output from a display element (224) is controlled, in part, by the data current applied through a coupling of the signal line driving circuit (12)); and

a voltage sensor (22, 23; see Fig. 3 and Fig. 5) to sense a voltage on the gate connection (i.e., to sense or determine the data voltage corresponding to the data current; again, see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-39);

a power controller (23, 22, 13) coupled to the voltage sensor (22, 23) for controlling an adjustable voltage power supply (13) to the plurality of adjustable constant current generators (i.e., see (ID, Iref) in (21) of Fig. 3 and Fig. 5 corresponding to a data current applied through a coupling of the signal line driving circuit (12); see Fig. 3 and Fig. 5), the power supply controller (23, 22, 13) being configured to reduce the power supply voltage (13) in response to the sensed voltage (22, 23) to a point where a voltage of the adjustable voltage power supply (13) is just sufficient for an adjustable constant current generator (i.e., see (ID, Iref) in (21) of Fig. 3 and Fig. 5 corresponding to a data current applied through a coupling of the signal line driving circuit (12); see Fig. 3 and Fig. 5) with a highest output current to be able to provide a highest gate connection voltage (i.e., a highest data voltage applied to (223)), the highest gate connection voltage (i.e., on a gate connection of (223)) being determined by the highest output current (i.e., inherently) in accordance with a compliance of the adjustable constant current generator (i.e., see (ID, Iref) in (21) of Fig. 3 and Fig. 5 corresponding to a data current applied through a coupling of the signal line driving circuit (12); see Fig. 3 and Fig. 5) with the highest output current (see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-51).

The electroluminescent display disclosed by Kimura is a current-driven active matrix. It is well known that the combined function of the signal line driving circuit (12) supplying a data voltage or current and the voltage power supply (13) supplying an adjustable reference voltage, determine the current driving the display pixel (10). Given

a data voltage or current from the signal line driving circuit (12) and a reference voltage (13), a given current (Iref) is expected to be produced through the display element (224). Thus, the signal line driving circuit (12) is inherently an adjustable constant current generator as the signal line driving circuit (12) generates the adjustable constant current (Iref) or (ID) for driving a row or column of the display. Further, it is inherent that the driving current is coupled to establish the voltage on the gate of the driving transistor. In fact, it is well known that the driving current and the voltage on the gate of the driving transistor are inherently proportional to each other. Still, Kimura does not explicitly state that the data voltage is provided by means of an adjustable constant current generator. In order to further prosecution, the examiner relies on Knapp.

Knapp explicitly discloses (see Fig. 1, Fig. 2, Fig. 3, and Fig. 5), that it is well known in the art to implement an adjustable constant current generator (18) in order to provide the data current or voltage to a driving transistor (i.e., see (24); see Page 3, Para. [0026]-[0029] and Page 4 through Page 5, Para. [0037]-[0038]). It is a goal of Knapp to provide an improved electroluminescent display driver that reduces the effect of variations in the transistor characteristics on light output (see Page 1 through Page 2, Para. [0006]-[0009]). This is also a goal of Kimura.

Therefore, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to combine the teachings of Kimura with the teachings of Knapp in order to reduce the effects of variations in the driving transistor characteristics. As such it would have been obvious to one of ordinary skill in the art to

try an implementation of the signal line driving circuit (12) of Kimura using an adjustable constant current generator as disclosed by Knapp.

13. As pertaining to **Claim 4**, Kimura teaches (see Fig. 3 and Fig. 5) that the voltage sensor (22, 23; see Fig. 3 and Fig. 5) is configured to sense the voltage on the gate connection (i.e., to sense or determine the data voltage corresponding to the data current) by sensing the voltage on an electrode of the display (again, see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-39).

14. As pertaining to **Claim 7**, Kimura also teaches (see Fig. 3 and Fig. 5) that the pixel (10) can include a photodiode (see Fig. 9, Fig. 15, Fig. 19), and wherein a photocurrent through the photodiode (again, see Fig. 9, Fig. 15, Fig. 19) is determined by the adjustable constant current to determine the brightness of the pixel (see Col. 36, Ln. 33-67, Col. 37, Ln. 1-8, Col. 22, Ln. 10-51).

15. As pertaining to **Claim 10**, Kimura discloses (see Fig. 3 and Fig. 5) that the highest output current is provided to a pixel (10) having a maximum brightness relative to others of the pixels (10; see Col. 22, Ln. 10-67, Col. 23, Ln. 1-11; the highest output current implicitly produces a display element (224) having a maximum brightness relative to the other display elements; also, see Fig. 6 and Fig. 7, as well as Col. 23, Ln. 39-67 and Col. 24, Ln. 1-22).

16. As pertaining to **Claim 13**, Kimura discloses (see Fig. 3 and Fig. 5) a display driver wherein the power controller (23, 22, 13) is further configured to increase the power supply voltage (13) when the gate connection voltage of the brightest pixel (10) has not reduced to less than a threshold value after a predetermined interval (i.e., any arbitrary interval; see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-51; the power controller (23, 22, 13) is configured to increase or reduce an adjustable voltage power supply).

17. As pertaining to **Claim 14**, Kimura discloses (see Fig. 1, Fig. 3, and Fig. 5) that the display driver further comprises the adjustable voltage power supply (i.e., see (13)).

18. As pertaining to **Claim 17**, Kimura discloses a method of operating (see Fig. 1, Fig. 3, and Fig. 5) a current driven active matrix electroluminescent display (see Abstract, Col. 1, Ln. 10-23 and Col. 23, Ln. 18-46), the display (see Fig. 1) comprising a plurality of pixels (10) each pixel (10) comprising an associated pixel driver (see (10) along with (11, 12, 13, 14, 16, 21, 22, 23) of Fig. 3), each pixel driver (see (10) along with (11, 12, 13, 14, 16, 21, 22, 23) of Fig. 3) including a drive field effect transistor (223) having a gate connection for driving the associated display element (224) in accordance with a voltage on the gate connection (Col. 19, Ln. 66-67 through Col. 21, Ln. 1-66), the display driver (see (10) along with (11, 12, 13, 14, 16, 21, 22, 23) of Fig. 3 and Fig. 5), the display having a plurality of adjustable constant current generators (i.e., see (ID, Iref) in (21) of Fig. 3 and Fig. 5 corresponding to a data current applied through

a coupling of the signal line driving circuit (12); see Fig. 3 and Fig. 5) each for driving a row or column of the display (see Fig. 1, Fig. 3, and Fig. 5) with an adjustable constant current (i.e., a data current corresponding to (Iref, ID), for example) determining the voltage (i.e., the data voltage) on the gate connection (see (223) in Fig. 1; also see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-39), an adjustable voltage power supply (13) coupled to the plurality of adjustable constant current generators (i.e., see (ID, Iref) in (21) of Fig. 3 and Fig. 5 corresponding to a data current applied through a coupling of the signal line driving circuit (12); see Fig. 3 and Fig. 5), and a plurality of control lines (see Fig. 1, Fig. 3, and Fig. 5) for setting the brightness of each pixel (10; again, see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-51), the method comprising:

controlling (i.e., see (12, 16, 21, 22, 23) of Fig. 3 and Fig. 5) the plurality of adjustable constant current generators (i.e., see (ID, Iref) in (21) of Fig. 3 and Fig. 5 corresponding to a data current applied through a coupling of the signal line driving circuit (12); see Fig. 3 and Fig. 5) to drive the gate connections (see (223 in Fig. 1)) to set the brightness of pixels (10) of the display using the control lines (see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-39);

monitoring (see (22, 23); see Fig. 3 and Fig. 5) control lines of the display to sense the voltages on the gate connections (i.e., to sense or determine the data voltage corresponding to the data current; again, see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-39); and

reducing (see (23, 22, 13)) the power supply voltage (13) responsive to the monitoring to a point where a voltage of the adjustable voltage power supply (13) is just sufficient for an adjustable constant current generator (i.e., see (ID, Iref) in (21) of Fig. 3 and Fig. 5 corresponding to a data current applied through a coupling of the signal line driving circuit (12); see Fig. 3 and Fig. 5) with a highest output current to be able to provide a highest gate connection voltage (i.e., a highest data voltage applied to (223)), the highest gate connection voltage (i.e., on a gate connection of (223)) being determined by the highest output current (i.e., inherently) in accordance with a compliance of the adjustable constant current generator (i.e., see (ID, Iref) in (21) of Fig. 3 and Fig. 5 corresponding to a data current applied through a coupling of the signal line driving circuit (12); see Fig. 3 and Fig. 5) with the highest output current (see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-51).

The electroluminescent display disclosed by Kimura is a current-driven active matrix. It is well known that the combined function of the signal line driving circuit (12) supplying a data voltage or current and the voltage power supply (13) supplying an adjustable reference voltage, determine the current driving the display pixel (10). Given a data voltage or current from the signal line driving circuit (12) and a reference voltage (13), a given current (Iref) is expected to be produced through the display element (224). Thus, the signal line driving circuit (12) is inherently an adjustable constant current generator as the signal line driving circuit (12) generates the adjustable constant

current (Iref) or (ID) for driving a row or column of the display. Further, it is inherent that the driving current is coupled to establish the voltage on the gate of the driving transistor. In fact, it is well known that the driving current and the voltage on the gate of the driving transistor are inherently proportional to each other. Still, Kimura does not explicitly state that the data voltage is provided by means of an adjustable constant current generator. In order to further prosecution, the examiner relies on Knapp.

Knapp explicitly discloses (see Fig. 1, Fig. 2, Fig. 3, and Fig. 5), that it is well known in the art to implement an adjustable constant current generator (18) in order to provide the data current or voltage to a driving transistor (i.e., see (24); see Page 3, Para. [0026]-[0029] and Page 4 through Page 5, Para. [0037]-[0038]). It is a goal of Knapp to provide an improved electroluminescent display driver that reduces the effect of variations in the transistor characteristics on light output (see Page 1 through Page 2, Para. [0006]-[0009]). This is also a goal of Kimura.

Therefore, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to combine the teachings of Kimura with the teachings of Knapp in order to reduce the effects of variations in the driving transistor characteristics. As such it would have been obvious to one of ordinary skill in the art to try an implementation of the signal line driving circuit (12) of Kimura using an adjustable constant current generator as disclosed by Knapp.

19. As pertaining to **Claim 23**, Kimura also teaches (see Fig. 3 and Fig. 5) that the pixel (10) can include a photodiode (see Fig. 9, Fig. 15, Fig. 19), and wherein a

photocurrent through the photodiode (again, see Fig. 9, Fig. 15, Fig. 19) is determined by the adjustable constant current to determine the brightness of the pixel (see Col. 36, Ln. 33-67, Col. 37, Ln. 1-8, Col. 22, Ln. 10-51).

20. As pertaining to **Claim 27**, Kimura teaches (see Fig. 3 and Fig. 5) the display driver configured to operate in accordance with the method (again, see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-51).

21. As pertaining to **Claim 28**, Kimura teaches (see Fig. 3 and Fig. 5) that the display comprises an organic light emitting diode display (see Col. 1, Ln. 10-23; also see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-51).

22. As pertaining to **Claim 30**, Kimura teaches (see Fig. 3 and Fig. 5) that the display comprises an organic light emitting diode display (see Col. 1, Ln. 10-23; also see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-51).

23. As pertaining to **Claim 31**, Kimura teaches (see Fig. 3 and Fig. 5) that the display comprises an organic light emitting diode display (see Col. 1, Ln. 10-23; also see Col. 20; Ln. 9-67 through Col. 21, Ln. 1-19; and see Col. 21, Ln. 29-67 through Col. 22, Ln. 1-51).

Response to Arguments

24. Applicant's arguments with respect to **Claims 1, 4, 7, 10, 13, 14, 17, 23, 27, 28, 30, and 31** have been considered but are moot in view of the new ground(s) of rejection. The applicant has argued that none of the references relied upon by the examiner in the prior Office Action teach or fairly suggest a plurality of adjustable constant current generators that can establish a voltage on a gate connection of a driver circuit. The examiner has found a number of the applicant's arguments to be persuasive. However, the majority of these arguments are moot in view of the new grounds of rejection over Kimura (US 6,518,962) in view of Knapp (US 2002 / 0126073). The remaining arguments are addressed herein.

The examiner would like to point out that the applicant has broadly claimed an invention that appears to rely heavily on implication and speculation (i.e., the claimed invention is both vague and indefinite). Firstly, the applicant claims a plurality of adjustable constant current generators acting in a current-driven active matrix display. As is commonly known in the art, all electroluminescent display devices are, in a sense, current driven, as the electroluminescent element is inherently a current driven element. Thus, whatever function is implied by the limitation "current driven" is open to any arbitrary interpretation of the electroluminescent display. (In fact, many current-driven electroluminescent display devices in the art do not utilize any external constant current

generating equipment; rather, the current driving is provided by the driving transistors and, particularly, the gate and power supply voltages). Further, the “adjustable constant current generators” are said to provide the voltage for driving the gate of the driving transistor. However, there is no current-to-voltage conversion recited in the claims and no such conversion is shown in the accompanying drawings. Thus, the adjustable constant current generators appear to be nothing more than adjustable constant voltage generators. Either way, voltage generators and current generators are well known in the art and both have been implemented in electroluminescent display devices for providing the data voltages applied to the data line (also called the signal line or the column line). Furthermore, it appears from the disclosure that the "adjustment" made to the constant current generators is made in view of the image data provided to the data line (i.e., the constant current generators simply generate the data currents or voltages supplied to the data line). This is an implicit feature of data line driving (i.e., changing data implies changing current or voltage on the data line). The claims make some inference to the adjustable constant current generators being controlled by the power controller in response to the voltage sensed on the gate line of the driving transistor. This does not appear to coincide with the specification. The specification discloses an invention in which the voltage power supply (i.e., Vss; see Fig. 8) is controlled based on the voltage sensed on the gate of the driving transistor. It is unclear how the voltage sensed on the gate of the driving transistor is associated with the constant current generators since no derivation of the gate voltage is shown in the claims and drawings.

According to the specification, as best understood by the examiner, the invention relates to a power controller implemented to control the voltage power supply (i.e., Vss shown in Fig. 8). The adjustable constant current generators appear simply as a means of supplying data current or voltage to the data line wherein the current or voltage is dependent on the particular image data. The invention seems to be directed to a reduction in the power consumption of a pixel by controlling the voltage power supply to be reduced when the highest data current produced by the constant current generators according to image data allows such reduction (i.e., in accordance with Fig. 6). That is, the invention is focused on the balance of driving voltages in the pixel (i.e., the balance between the power supply voltage Vss and the gate voltage applied to the driving transistor). It is well known in the art that an active matrix electroluminescent display driver circuit comprises a driving transistor wherein the current used to drive the electroluminescent element is provided through the control of this driving transistor. It is further well established that in the active matrix configuration, the current used to drive the electroluminescent element is controlled through the combined control of the gate and source voltages of the driving transistor. That is, the driving current is controlled by controlling the voltage applied to the gate of the driving transistor and by controlling the power supply or reference voltage applied to a source or drain electrode of the driving transistor. This implementation is shown explicitly by Kimura in Fig. 1, Fig. 3, and Fig. 5. *As stated by the examiner in the interview conducted on 10 September 2009, it is the opinion of the examiner that the inventive concept that should be expanded upon in the claims relates to the implementation of the power controller.* As the examiner has

stated and shown herein, adjustable constant current generators to provide data currents as well as voltage sensors to sense the voltage (either directly or indirectly) of the gate of the driving transistor are well known in the art.

Conclusion

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON M. MANDEVILLE whose telephone number is 571-270-3136. The examiner can normally be reached on Monday through Friday 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Eisen can be reached on 571-272-7687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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